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BULLETIN OF COURSES. WATER POLLUTION CONTROL TECHNICAL TRAINING PROGRAM. JULY 1968 TO JUNE 1969

Federal Water Pollution Control Administration
Washington, D. C.

1969

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JULY 1968 TO JUNE 1969

BULLETIN OF COURSES

CLEAN WATER

WATER POLLUTION CONTROL TECHNICAL TRAINING PROGRAM

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U.S. DEPARTMENT OF THE INTERIOR
FEDERAL WATER POLLUTION CONTROL ADMINISTRATION

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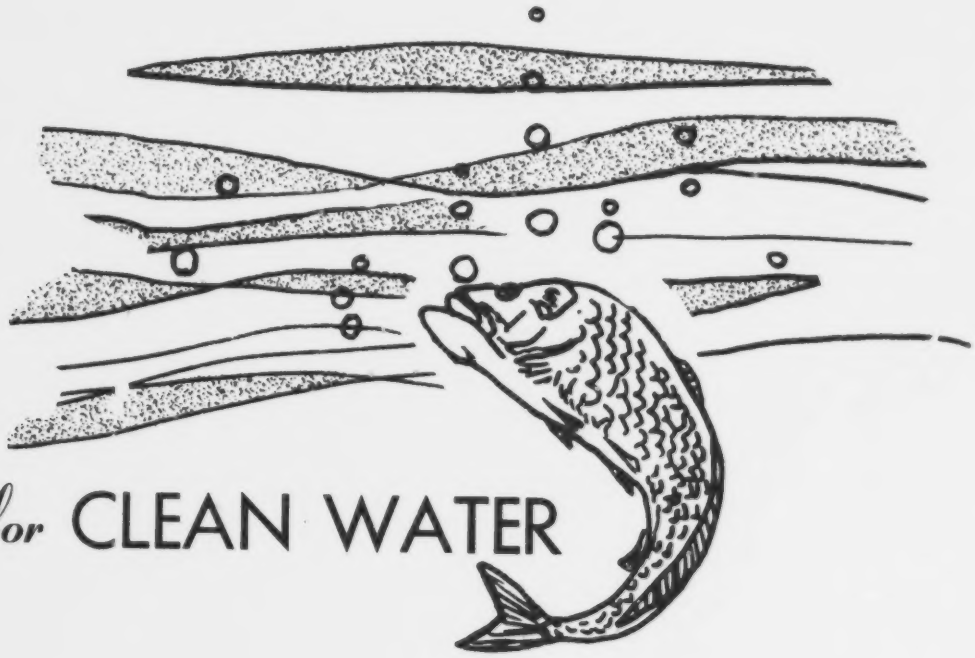


Training for CLEAN WATER

America's rivers, lakes and coastal waters have nourished her growth: irrigated the farms, powered the dynamos, and provided transport for commerce.

But we have not used our waters well.

Our major rivers are defiled by noxious debris. Pollutants from cities and industries kill the fish in our streams. Many waterways are covered with oil slicks and contain growths of algae that destroy productive life and make the water unfit for recreation. "Polluted Water -- No Swimming" has become a familiar sign on too many beaches and rivers. A lake that has served many generations of men now can be destroyed by man in less than one generation.

Only recently have we begun to reverse this trend -- to undertake a program to preserve waters that are still clean, and purify those that have become infested with pollution.

America took strong action to combat the problem in 1965 with the Water Quality Act, and took another major step a year later with the Clean Water Restoration Act. Under those measures, the long and difficult task of cleaning the waters of our land has begun.

President Lyndon B. Johnson
Message to the Congress,
March 8, 1968

JULY 1968 TO JUNE 1969

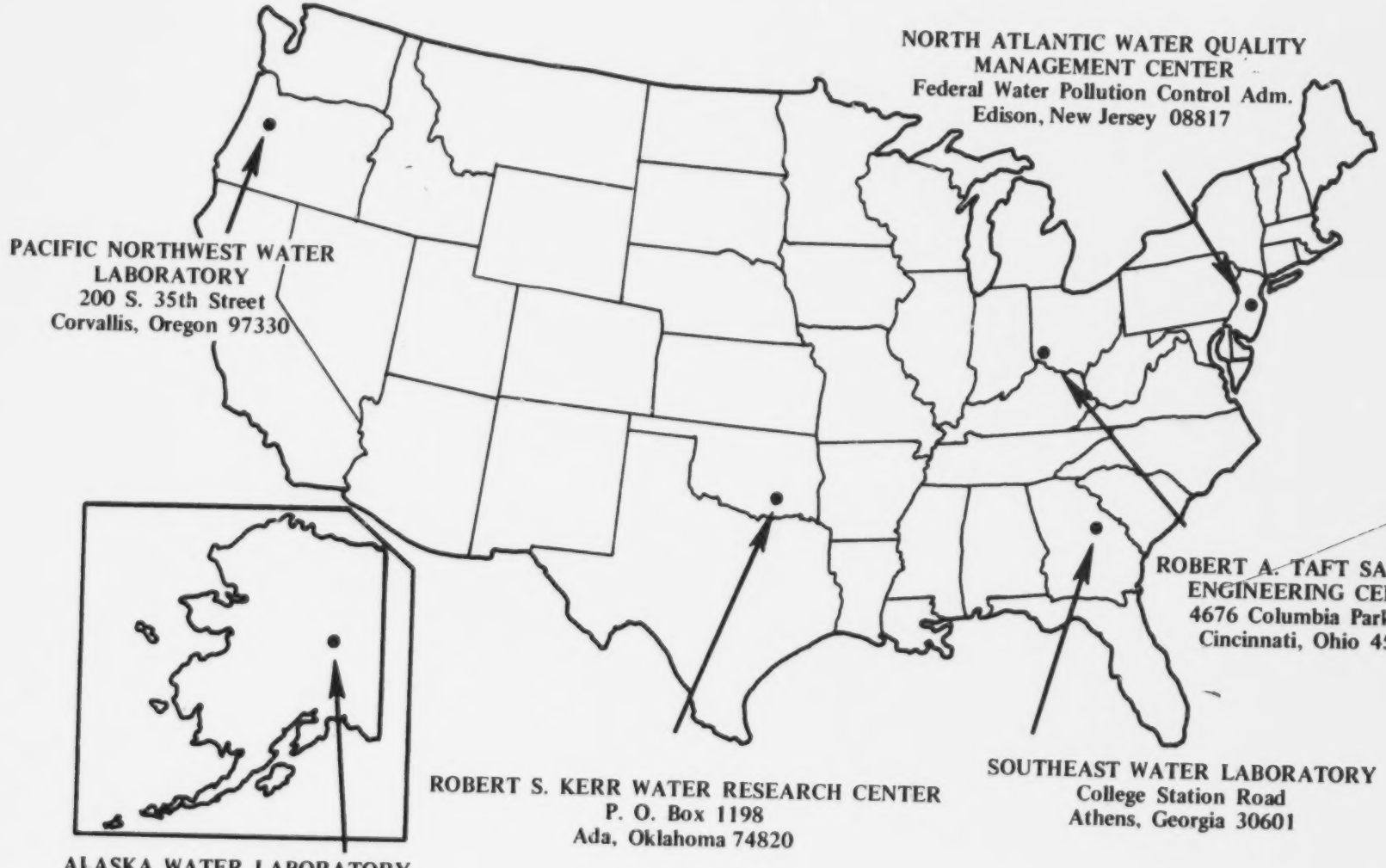
BULLETIN OF COURSES

WATER POLLUTION CONTROL TECHNICAL TRAINING PROGRAM

Details of illustrations in this document may be better studied on microfiche.

U.S. DEPARTMENT OF THE INTERIOR
Federal Water Pollution Control Administration

FWPCA TRAINING LOCATIONS



NORTH ATLANTIC WATER QUALITY
MANAGEMENT CENTER
Federal Water Pollution Control Adm.
Edison, New Jersey 08817

PACIFIC NORTHWEST WATER
LABORATORY
200 S. 35th Street
Corvallis, Oregon 97330

ROBERT A. TAFT SANITARY
ENGINEERING CENTER
4676 Columbia Parkway
Cincinnati, Ohio 45226

ROBERT S. KERR WATER RESEARCH CENTER
P. O. Box 1198
Ada, Oklahoma 74820

SOUTHEAST WATER LABORATORY
College Station Road
Athens, Georgia 30601

ALASKA WATER LABORATORY
P.O. Box 617
College (Fairbanks), Alaska 99735

Information for Applicants

The Training Program and Its Objectives

The Federal Water Pollution Control Administration of the U. S. Department of the Interior conducts programs of research, technical assistance, enforcement, and technical training for water pollution control.

The recent activation of several new Field Laboratories has resulted in an increase in both the number of training facilities available across the country, and in the range of technical subject matter taught. Technical training now is available at the Robert A. Taft Sanitary Engineering Center in Cincinnati, Ohio; the Robert S. Kerr Water Research Center, Ada, Oklahoma; the Southeast Water Laboratory, Athens, Georgia; the Alaska Water Laboratory, College (Fairbanks), Alaska; the Pacific Northwest Water Laboratory, Corvallis, Oregon; and the North Atlantic Water Quality Management Center, Edison, New Jersey.

The objectives of the Training Program are to provide specialized training in the field of water pollution control which will lead to rapid application of new research findings through updating of skills of technical and professional personnel, and to train new employees recruited from other professional or technical areas in the special skills required. Scientists, engineers, and recognized authorities from other FWPCA programs, from other government agencies, universities, and industry supplement the training staff by serving as guest lecturers and technical consultants. Most training is conducted in the form of highly technical, short-term courses, of one or two weeks' duration. The scope and level of these courses is modified to meet specific training needs objectives. Subject matter includes selected practical features of plant operation and design and water quality evaluation in field and laboratory. Specialized aspects and recent developments of sanitary engineering, chemistry, aquatic biology, microbiology, and field and laboratory techniques, not generally available elsewhere are included.

The primary role and responsibility of the States in the training of wastewater treatment plant operators are recognized. This Training Program offers courses in special aspects of wastewater treatment plant operations not usually included in the training programs of the States. In addition, support of operator-training programs of the States is available through technical consultations in the planning and development of operator-training courses. Guest appearances of instructors from the Training Program of the Federal Water Pollution Control Administration, instructional materials, lesson plans for instructional personnel, and visual and other training aids for classroom use, may be reproduced freely by the States for their own training programs.

Admission to Courses

Admission to courses is by application forms provided at the back of the Bulletin. Additional forms may be obtained from any Federal Water Pollution Control Administration Water Laboratory, or from:

Chief, Training Program
Department of the Interior, FWPCA
Robert A. Taft Sanitary Engineering Center
4676 Columbia Parkway
Cincinnati, Ohio 45226
Area Code 513: 871-1820, Extension 248

NO TUITION OR REGISTRATION FEE IS CHARGED. Early application is advised, since course rosters are limited. Trainees arrange for their own housing and transportation while attending courses. To apply for admission to a course, fill out an application form at the back of the Bulletin, using a separate form for each course. Mail to the Laboratory offering the training. Information on local transportation and housing will be mailed to accepted applicants four to six weeks prior to course date.

Related Environmental Training Programs

Listed below are other training programs which may be of interest to the reader of this bulletin. Inquiries about specific courses should be sent directly to the programs involved.

Chief, Training Program
National Center for Urban and Industrial Health
DHEW, Public Health Service
222 East Central Parkway
Cincinnati, Ohio 45202

Chief, Training Program
National Center for Air Pollution Control
DHEW, Public Health Service
Mutual Plaza
411 W. Chapel Hill Road
Durham, North Carolina 27702

Director, Training and Manpower Development Program
National Center for Radiological Health
DHEW, Public Health Service
1901 Chapman Avenue
Rockville, Maryland 20852

Chief, Training Branch
National Communicable Disease Center
Atlanta, Georgia 30333

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Levels of Learning

The following levels of learning are used in our Course Descriptions to help those interested in training to understand the objectives and emphasis of each course.

The following table defines the levels of learning[1] used in this Bulletin of Courses

Levels of Learning	Definition of Learning	Teacher-supplied Support Material	Mental functions employed to achieve this learning
BASIC LEVELS			
Application	For mental application: Use of facts, principles, ideas or concepts for interpreting situations and in solving problems both real and hypothetical. For physical application: Physical ability to perform an integrated sequence of related actions.	For mental application: Opportunity for generalizations or transfer of learning (case histories, problem situations, etc.) For physical application: Clear-cut explanation-demonstration of the skill. Supervision of student performance to insure that he uses the same sequence of actions as taught in the explanation-demonstration.	For mental application: Generalizations or transfer of learning creativity, rational perception. For physical application: Establishment of stimulus response conditioning of reflexes to the intellectual solution of mechanical problems.
Understanding	Comprehension of concepts and ideas for, and the background of the concept or idea.	Support in terms of the "hows" and "whys" of the concept or idea and its implications.	Comparison and contrast, development of a concept, comprehension of implications of concepts. Insight.
Knowledge	Acquisition of factual information — simple recall of verbal or symbolic material.	Support in terms of the "what," "when" and "where" of the factual or symbolic material.	Simple recall, association of material with previously learned facts.
Familiarity	Initial acquaintance with verbal or symbolic material in a unit or specific lesson.	Basic "what," "when" and "where" of material in new unit.	Awareness of, or initial link with material.

[1] Principles and Techniques of Instruction, Academic Instructor and Allied Officer School, Air University Maxwell A.F.B., Alabama, August 1964.

Course Descriptions

CHEMICAL ANALYSES FOR WATER QUALITY (100)

2 weeks

CINCINNATI, OHIO — **July 15-26, 1968**
CORVALLIS, OREGON — **March 10-21, 1969**

This course is designed for chemists, biologists and engineers having a professional background and responsibility in performing, using or interpreting chemical analyses for water quality.

Major objectives are:

- To promote an understanding of selected tests employed in chemical analysis
- To outline advantages and limitations of specific test methods or instrumentation
- To improve capabilities for selection of effective analytical methods
- To practice application of selected wet chemical and instrumental methods, and
- To evaluate results in terms of statistical inferences.

Selected analytical procedures are presented in lecture-discussion sessions in the classroom outlining essentials of the test, control technique and interpretation. Various methods are stressed that are useful to increase specificity and validity of chemical criteria related to water pollution control, and compliance with water quality standards for the acceptability of water for all beneficial uses. About half of the course time is devoted to trainee practice in laboratory operations. The trainees utilize wet chemical procedures and instrumentation for visible, infrared, flame and atomic absorption spectroscopy, polarography, dissolved oxygen, pH and conductivity meters. Calculation of results are performed in homework or workshop sessions and the results compared statistically in class discussions.

The trainees have an opportunity for conferences on special problems with specialists who may be available during the course. Those enrolled in the course have an opportunity to broaden their contacts in the field, to acquire new sources of information and to enhance their capabilities for getting meaningful results that are related to the particular situation.

CHARACTERIZATION AND TREATMENT OF ORGANIC INDUSTRIAL WASTES (101)

2 weeks

ATHENS, GEORGIA — **September 16-27, 1968**

This course is offered for engineers, chemists and other professional personnel concerned with the characterization and treatment of organic industrial wastes. It is planned that the interests of both public officials and representatives of industry will receive coverage. The course is designed for those persons who have some degree of specialization in industrial wastes surveys and treatment procedures but whose experience or range of coverage in this field is limited.

On completion of the course the trainee should be able to select and perform procedures for collecting, characterizing and measuring quantities of industrial water pollutants. It is also an objective of this course that the student be able to evaluate and select methods of treatment applicable to industrial wastes. This course has the further objective of providing insight to regulatory personnel on waste treatment problems and in bringing to the attention of industry the problems faced by water pollution control agencies in performing their job.

Trainees will devote a considerable portion of course time to laboratory studies of organic pollutant detection techniques. Laboratory work will include column and thin-layer chromatography and infrared spectroscopy. Laboratory and problem sessions will also be devoted to selection of adequate treatment methods for several organic industrial wastes. The wastes to be discussed include those from the textile production, pulp and paper, food processing, and pesticide production industries.

The utilization of advanced waste treatment methods, especially as applied to removal of organic industrial wastes will be covered. Time will also be devoted to selection and use of monitoring equipment.

ANALYSIS OF PESTICIDES IN THE AQUATIC ENVIRONMENT (103)

2 weeks

ATHENS, GEORGIA	**March 3-14, 1969**
CINCINNATI, OHIO	**April 28-May 9, 1969**

The course is designed for professionals and technical specialists desiring to learn how to select and perform procedures for the collection, identification and measurement of persistent pesticides in the aquatic environment. Previous experiences associated with methodology pertaining to the measurement of chemical pollutants in water is desirable.

Upon completion of the course, the trainee will be able to apply the fundamental concepts of infrared, thin-layer and gas chromatographic techniques for the analysis of pesticides. He will have an understanding of the distribution and behavior of pesticides in the environment and will be knowledgeable regarding improved techniques of sample preparation and analysis.

The analytical procedures taught in the course will conform to those currently in use by the Federal Water Pollution Control Administration in its official investigations. In addition, attention will be given to implications of the latest research.

Lecture topics will include:

- Distribution and behavior of pesticides in the aquatic environment
- Collection and preservation of water, sediment and biological samples
- Extraction methods
- Column and thin-layer chromatography
- Gas chromatography and detector technology applicable for the analysis of pesticides
- Infrared spectroscopy
- Enzymatic methods
- Comparative methodology and quality control.

Laboratory practice will comprise one half of the course content and will include the following analyses:

- Clorinated hydrocarbon insecticides and phenylalkanoic acid herbicides in water
- Organophosphorus and chlorinated hydrocarbon insecticides in sediment
- Clorinated hydrocarbon insecticides in fish.

LABORATORY ANALYSES IN TREATMENT PLANT OPERATIONS (105)

2 weeks

CINCINNATI, OHIO	**October 28-November 8, 1968**
ATHENS, GEORGIA	**November 18-22, 1968***
EDISON, NEW JERSEY	**January 27-February 7, 1969**
CORVALLIS, OREGON	**May 5-16, 1969**

This course is intended for personnel responsible management, supervision, or performance of wastewater plant laboratory operations.

The primary objective is to enhance the reuse potential of treated wastewaters by means of improved competence and communication among the sampler, the analyst and operating personnel. Consideration will be given to the basis for selection of specific tests, the items measured and the means whereby sampling or sample inconsist[illegible]ies may be minimized by control of method, human, instrumental or conditional variables.

The course will include lectures on and class discussions of specific laboratory determinations and their significance in operational situations. More than 50% of class time will be devoted to demonstrations and laboratory practice to promote techniques necessary to perform and to validate analytical results.

A multidiscipline approach will be used emphasizing determinations such as the coliform group, dissolved oxygen, biochemical oxygen demand, chemical oxygen demand, suspended, volitile and total solids. Bioassay, nitrogen, phosphorus and organisms will be considered in terms of the treatment plant and receiving water system. Plant loading, respiration, and settleability will be discussed in terms of their contribution to the daily operation of aerobic and anaerobic treatment processes.

*A one week presentation of this course will be given in Athens, Georgia with emphasis on the coliform group, oxygen demand, and solids criteria.

ORIENTATION TO AUTOMATED INSTRUMENTATION IN SURVEILLANCE (106)

1 week

CINCINNATI, OHIO **January 27-31, 1969**

This course is offered for management personnel responsible for program development and execution of water pollution surveillance programs.

The course is intended to familiarize course participants with the capabilities of automated, multi-parameter water quality surveillance instrumentation and principles of utilization of such instrumentation in continuous, long-term surveillance programs.

Lectures, discussions, demonstrations and seminars are utilized to define environmental situations which require continuous surveillance and provide a basis for technical and/or economic evaluation of use of automatic instrumentation in such a program. Examples of actual application and operational demonstrations are presented and discussed. Available equipment is reviewed with opportunity for evaluation of the merits of each system.

Additional subjects discussed include:

Development and use of instrument specifications
Installation and site requirements
Operation and maintenance requirements
Operating problems
Storage, retrieval, and analysis of data.

CURRENT PRACTICES IN WATER MICROBIOLOGY (120)

2 weeks

CORVALLIS, OREGON **December 2-13, 1968**

CINCINNATI, OHIO **January 6-17, 1969**

The course is designed for professional bacteriologists and other laboratory personnel engaged in the bacterial analysis of water in Federal, state or local laboratories.

The basic purpose of the course is to provide the participant with up-to-date background information thus enabling him to acquire knowledge and skill to determine the bacterial quality of water in accordance with the highest standards of current recommended methodology.

To achieve this broad objective, emphasis is given both to the traditional and to the recent and current results of investigations of bacterial indicators of pollution, including coliforms, fecal coliforms and fecal streptococci. The characteristics, environmental occurrence, significance and methods of detection and enumeration of these bacterial groups are studied in detail. In addition, attention is given to the detection of enteric pathogenic bacteria in polluted waters, as an adjunct to determination of indicator groups, and to the increasing utilization of such findings in investigations of water pollution.

Classroom presentations and extensive laboratory application give the participant opportunity to develop ability in use of the most suitable laboratory methods and in the interpretation of laboratory data. Both Standard Methods and promising new methods are included. Multiple dilution tube methods and membrane filter methods are featured in the laboratory studies.

The scope of the course is broadened through classroom presentations on pertinent related topics, such as the role of the bacteriologist in planning, conducting and interpreting results of water pollution surveys; critical factors in collection and handling of samples for bacterial tests; occurrence and significance of other microscopic biota. Special laboratory studies include tests for further identification of pure cultures of fecal streptococci and testing the quality of distilled water supplies for use in the bacteriology laboratory.

Opportunity is provided for individual conferences with research personnel and other specialists on technical problems not specifically dealt with in this course.

MEMBRANE FILTER METHODS IN TREATMENT PLANT OPERATIONS (121)

1 week

CINCINNATI, OHIO	**September 9-13, 1968**
ATHENS, GEORGIA	**April 21-25, 1969**

The course is intended to meet the needs of treatment plant operators and others using membrane filters for the bacterial analysis of waters and wastewaters. Applicants also are admitted from Federal, state or local water pollution control agencies and health departments, university faculties and private industry. Non-laboratory personnel may be accepted for training, but should understand that the course subject matter and laboratory instruction are oriented to the needs of the laboratory worker.

Approximately half of the instruction is devoted to classroom presentations; all other scheduled activity is directed to a carefully planned and graded series of laboratory studies placing increasing demands on the exercise of individual skill and judgment in the effective use of membrane filter methods. Students completing this course are able to apply the necessary techniques in use of membrane filters in water bacteriology. They can select, prepare and maintain laboratory supplies, equipment and culture media; they perform sample filtrations, incubation and examination of membrane filter cultures, including the computation and reporting of results. They can review their own laboratory practices and results critically for maintenance of the highest standards of performance. To provide assistance in meeting a provisional approval of membrane filter methods in the current (12th) edition of "Standard Methods for the Examination of Water and Wastewater" a protocol for comparative testing between membrane filter methods versus the multiple tube method is included in the course.

In addition, students are acquainted with several types of special membrane filter equipment suitable for use in field or emergency conditions. While the course normally is directed toward development of proficiency with equipment intended for use in the laboratory, special arrangements can be made whereby individuals can take the course with the entire laboratory program directed to use of field equipment.

BASIC FRESHWATER BIOLOGY (140)

1 week

CORVALLIS, OREGON	**September 9-13, 1968**
ADA, OKLAHOMA	**April 7-11, 1969**
CINCINNATI, OHIO	**May 19-23, 1969**
ATHENS, GEORGIA	**June 16-20, 1969**

This course is designed for sanitary engineers, scientists and non-biologists engaged in water pollution analysis and control activities; however, biologists new to the field of pollution control may find it useful for orientation. The week is devoted to the study and identification of freshwater organisms, with field observations on their basic responses to pollution whenever practicable.

It is the general objective of this course to enable nonbiologists to become familiar with aquatic organisms and to make observations which will be useful in the analysis of water quality.

Within the framework of his personal background, capacities, and experience, the trainee should be able, on completion of this course to:

- Recognize or identify most freshwater organisms commonly encountered, using correct procedures and appropriate literature when available, and also using judgment in assessing his own technical capacity in regard to the degree of identification attempted.
- Select and use appropriate common types of biological field collection equipment and procedures.
- Select and use appropriate types of biological laboratory analytical equipment and procedures.
- Sort, enumerate, and count collections of macroinvertebrates and plants, and properly record the results.
- Make gross analyses of plankton or nekton, or carry out more refined analyses under supervision.
- Carry out other assignments concerned with the collection, identification, or enumeration of freshwater organisms.

Trainees should provide themselves with appropriate clothing for field work. A limited number of boots will be supplied locally.

This course is usually offered in conjunction with Course No. 143 "Freshwater Pollution Ecology" for which it will suffice as prerequisite.

FRESHWATER POLLUTION ECOLOGY (143)

1 week

CORVALLIS, OREGON	**September 16-20, 1968**
ADA, OKLAHOMA	**April 14-18, 1969**
CINCINNATI, OHIO	**May 26-30, 1969**
ATHENS, GEORGIA	**June 23-27, 1969**

This course is offered for all professional personnel concerned with and/or involved in the application of biological principles, techniques and parameters to pollution studies and abatement programs. Persons professionally oriented in the biological sciences will benefit particularly from the opportunity to update their knowledge of bioassay methods and applications.

Course work includes lectures, discussions, problem assignments and laboratory sessions. Trainees will set up and run toxicity bioassays to ascertain the effect of various agricultural, industrial and municipal wastes.

Within the limitations of his personal background capacities and experience, the trainee will be able on completion of this course to:

- Analyze an aquatic community and assess the likelihood that it may have been disturbed by pollution
- Recognize biological indications of particular types of pollution when present
- Predict possible effects of a given type of pollutant on a given habitat
- Evaluate the acute toxicity of a pollutant, or predict the effect of a given quantity of its discharge to a given body of water
- Organize an in-plant survey using bioassay to determine the relative toxicities of various process effluents
- Organize a field survey to determine the severity and extent of pollution
- Carry out other assignments concerned with the interaction between pollution and the aquatic environment.

Field work is included only when this course follows "Basic Freshwater Biology (140)".

Agenda topics will usually include:

- Use of bioassay in evaluating toxic wastes
- Thermal pollution
- Biological problems of lakes, reservoirs, and streams
- Investigation of fish kills
- Eutrophication in the freshwater environment
- Water quality criteria for aquatic life

INTRODUCTORY MICROSCOPIC ANALYSIS OF WATER (142)

1 week

CINCINNATI, OHIO **February 24-28, 1969**

This course is offered for the orientation of wastewater or water supply treatment plant operating personnel, field survey officers, laboratory personnel, and others concerned with basic problems pertaining to the microscopic examination of water and sludges. Since the procedures and types of organisms encountered are essentially the same, regardless of whether one is concerned with a stabilization pond, a potable water supply, or an activated sludge tank, the basic techniques are equally useful in each case.

Instruction enables the trainee to recognize and frequently to control the various types of pollution problems caused by troublesome microorganisms, e.g., algae and other organisms which may create tastes and odors, clog filters, or form troublesome turbidities or blankets in reservoirs, holding basins, streams, etc. The trainee gains a fundamental competence to interpret the significance of the various types and numbers of microorganisms, and is able to organize a simple sampling program. Opportunity is provided also for discussion of local situations and problems.

The following topics are usually included in the course agenda:

- Identification of types of microorganisms (an extensive series of laboratories and lectures)
- Techniques of field sampling programs
- Techniques of laboratory preparations for microscopic observation
- Calibration of equipment
- Quantitative and qualitative counting
- Principles of field and in-plant control of microorganisms

A more advanced treatment of this field is offered in Course No. 141, "Plankton Analysis."

Although microscopes are available for class use, trainees are urged to bring their own instruments to the course. They should be hand-carried, not shipped, if possible. In this way, trainees can be instructed in obtaining optimum results with the same instrument they will be using in their home laboratory.

It should include magnifications of approximately 100X and 400X. 200X is also very useful and 20X objectives to attain this magnification (with 10X oculars) will be supplied by the Center if necessary. Oil immersion is optional. Further information will be provided on request.

PLANKTON ANALYSIS (141)

2 weeks

CINCINNATI, OHIO **October 7-18, 1968**

This course is offered for professional personnel concerned with the evaluation of natural and polluted waters by means of plankton examination. Limited attention is also devoted to the examination and interpretation of the fauna of activated sludge and waste stabilization ponds.

Instruction enables the trainee to carry out basic laboratory procedures in the identification and counting of both phytoplankton and zooplankton. Forms frequently found in water and wastewater treatment plants and polluted environments are emphasized. Class members carry counting and enumeration to the point where all obtain essentially the same result on a given sample.

Attention is given to the significance of various types of counts. Techniques for plankton control are presented. Time is provided for discussion of local problems, both in class and with specialists at the training facility.

Course topics usually include:

- Water quality problems of biological origin
- Identification of planktonic animals and plants (an extensive series of lectures and laboratories)
- Microscope calibration
- Plankton analysis
  - Sampling and preparation
  - Techniques of counting
  - Enumeration, methods selection
- Plant operation problems
  - Plankton in stabilization ponds
  - Activated sludge fauna
  - Toxic algae
  - Other biological treatment problems
- Plankton control
  - Plant control
  - Control in surface waters

Although microscopes are available for class use, more effective training results when it is given on the same instrument that will be used in the home laboratory. Trainees consequently are urged to bring their own microscope to the course. They should be hand-carried, not shipped, if possible. In this way, trainees can be instructed in obtaining optimum results with the same instrument they will be using at home. The microscope should have magnifications up to approximately 400 X; oil immersion is optional.

Introductory treatment of this subject is offered in "Introductory Microscopic Analysis of Water," Course No. 142.

BASIC MARINE BIOLOGY (144)

1 week

EDISON, NEW JERSEY **October 21-25, 1968**

This course is designed as an introduction to marine biology for sanitary engineers, scientists, and others who are involved in coastal and estuarine pollution studies, surveillance, and control. Biologists new to the field of marine biology and pollution problems may find it useful for orientation.

Basic Marine Biology is primarily devoted to a survey of the various types of marine and estuarine plants and animals, with particular emphasis given to those with a known pollutional relationship. The general objective is to enable non-biologists to become familiar with marine organisms, and to make observations and record data which will be of use in the analysis of marine water quality.

Within the framework of his personal background, capacities, and experience, the trainee should be able, on completion of this course to:

- Recognize or identify most marine organisms commonly encountered in the region in which the course was given, using correct procedures and appropriate literature when available, and also using judgment in assessing his own technical capacity in regard to the level of identification attempted.
- Select or recommend appropriate types of common biological field collecting equipment and procedures for use in various local circumstances.
- Select or recommend appropriate types of common biological laboratory analytical equipment and procedures
- Use selected items of field and laboratory equipment
- Sort, enumerate, and count collections of marine and estuarine macroinvertebrates and plants and properly record the results.
- Make gross analyses of plankton or nekton, or carry out more refined analyses under supervision
- Carry out other assignments concerned with the collection, identification, or enumeration of marine or estuarine organisms.

Trainees should provide themselves with appropriate clothing for field work. A limited number of boots will be supplied locally when required.

This course is designed to be followed by Course No. 145 "Marine Pollution Ecology" which will probably be offered in fiscal year 1970.

APPLIED BIOLOGY SEMINAR (146)

3 days

CINCINNATI, OHIO **January 22-24, 1969**
Other locations by arrangement

This course is intended for orientation of persons concerned with planning, administering, collecting, evaluating, interpreting and reporting biological data related to water quality studies in both fresh and marine waters. The trainees need not necessarily be biologists.

The main objective of this course is to promote more effective utilization of this technical discipline which is fundamental in water pollution control. This will be accomplished by imparting a more complete understanding of the advantages and potential contributions of biological data and investigations to administrators, project leaders and others. Biologists will gain a better understanding of the limitations and restrictions placed on the administrator, and the nature of biological data which will be most useful for the improvement of water quality.

The following topics will usually be included:

- Orientation in the nature of the aquatic environment and aquatic ecology
- The nature of biological parameters
- Definition of "pollution" under various circumstances
- Orientations in the nature of various biological procedures and habitats such as taxonomy, benthos, periphyton, plankton, nekton, bioassays, and bacteriological investigations, followed by searching discussion of the potential of each water quality enhancement
- Techniques for the evaluation and interpretation of biological data
- The duties of the administrator and his need for biological data
- The multilateral problems of communication
- The use of biological data in the establishment and administration of water quality standards and criteria

Much of the course will consist of short formal presentations followed by extended informal discussions in the manner of a seminar. No laboratory or field sessions are usually scheduled, although an optional field excursion following the formal course may be arranged when sufficient interest is expressed.

MARINE POLLUTION ECOLOGY SEMINAR (147)

4 days
(Including one day field trip)

ANCHORAGE, ALASKA **June 24-27, 1969**

This seminar is offered for professional specialists, business and industry management, and Federal and State government officials having administrative and operational responsibilities in planning and conducting activities with potential for creating or preventing marine pollution.

The seminar is intended to provide a common denominator between pollution prevention enforcement and pollution prevention through good management. In line with these objectives, seminar topics will be divided into formal presentations followed by group discussion.

Seminar topics include:

- Basic vocabulary of practical biological terms
- The laws and principles governing distribution and survival of aquatic organisms
- Recognition of critical ecological parameters in a marine environment
- Marine waste disposal
- Toxicity of wastes to marine organisms
- Effects of pollution of various marine communities.

A one-day field trip will be scheduled, if practicable, to give the group an opportunity to discuss marine pollution ecology while observing factors creating pollution.

INTRODUCTION TO WATER QUALITY STUDY AND SURVEY COURSES

Identification and measurement of water quality conditions is contingent upon the application of knowledge specific to particular branches of physical and biological sciences. Overall water quality evaluation, on the other hand, requires understanding of the interaction and interrelationship of chemical and biological parameters, hydraulic principles and hydrologic conditions prevailing in a defined area (drainage basin). Programs to prevent or limit adverse water quality situations must correlate the technology of measurements and evaluation with understanding of socio-economic and legal conditions, concepts and principles prevailing in the human community.

The following three courses are concerned with the factors used to determine water quality and to recognize pollution. As such, the courses contribute to the overall objective of supporting programs to prevent or limit water pollution.

The content of the courses "Water Quality Surveys I and II (261 and 262)" and "Water Quality Studies (161)" is basically the same. The emphasis and depth of coverage is varied to serve the needs of professional personnel having diverse types of responsibilities in planning, performing and administering programs related to water quality. To select the appropriate course(s), applicants should review the individual course descriptions in terms of their particular interest and program responsibility.

WATER QUALITY SURVEYS — I (261)
Field and Laboratory Procedures

1 week

ADA, OKLAHOMA — **October 7-11, 1968**

ADA, OKLAHOMA — **May 12-16, 1969**

This course is designed for personnel actively engaged in field projects of water quality measurements and pollution identification. Emphasis is placed on understanding interdisciplinary needs and responsibilities in the accumulation and interpretation of data from field and laboratory activity.

Trainee performance in field sampling and measurements and in laboratory analyses of either collected or synthesized samples is intended to provide familiarity with new methods, techniques and instruments, and to accomplish awareness of advantages and limitations thereof. Lectures and discussion periods develop an understanding of the related principles and theories.

Subject areas that may be covered include:

- General orientation to the aquatic environment and to the life systems existing within or dependent upon that environment
- Oxygen analyses in relation to various categories of pollutants
- Sampling techniques and procedures for identification and enumeration of bacterial indicators of pollution
- Biological responses to pollution
- Flow measurements and current studies.

WATER QUALITY SURVEYS — II (262)
Planning and Administrative Concepts

1 week

ADA, OKLAHOMA	**October 14-18, 1968**
ADA, OKLAHOMA	**May 19-23, 1969**

This course is organized for the benefit of supervisory personnel and administrators responsible for planning and implementation of programs to evaluate or improve water quality conditions. The structure of the course is designed to include the essential elements of a successful water quality survey. The survey must proceed in carefully planned sequence and include the following categories of activity:

Establishment of survey objectives
- Accumulation and evaluation of recorded data and literature
- Determination of information deficiencies
- Definition of interdisciplinary responsibilities
- Establishment of work schedule and determination of personnel and equipment needs
- Survey performance
- Compilation, integration and evaluation of accumulated data and information
- Report preparation and presentation
- Recommendation for future action (including possible alternatives) based on knowledge of socio-economic conditions and legislative authorization.

WATER QUALITY STUDIES (161)

2 weeks

CORVALLIS, OREGON	**July 15-26, 1968**
HARRISBURG, PENNSYLVANIA	**August 12-23, 1968**
EDISON, NEW JERSEY	**February 10-21, 1969**

This course is offered for all professional specialists having administrative and/or operational responsibility in planning and conducting water pollution surveys. The course is designed to be of greatest benefit to personnel new to the field of water pollution control and to professionally mature individuals whose normal duties in water quality surveys are too specialized to permit an overall view of the factors entering into the determination of water quality.

The course is intended to provide understanding of the interrelationships and interdependency of the various technical disciplines in the comprehensive evaluation of water quality.

Lectures, panel discussions and classroom demonstrations are supplemented by direct trainee involvement in field and laboratory studies.

Major subject areas of the course may include:

- Orientation to the aquatic environment and to the life systems existing within or dependent upon that environment
- Sources and causes of water quality deterioration
- Tests and measurements used in evaluation of water quality by engineers, biologists, chemists and microbiologists. This aspect of the course includes consideration of new technical developments in instrumentation, laboratory methodology and related administrative consideration in planning
- Fundamental factors in planning, conducting and interpreting findings and reporting results of a water pollution survey
- Special categories of water quality studies, such as ground water, tidal waters, acid mine drainage and others appropriate to particular regions
- Water quality monitoring and surveillance.

BIOLOGICAL TREATMENT OF WASTEWATERS AND SLUDGES (162)

2 weeks

CINCINNATI, OHIO **February 10-21, 1969**

This course is offered for engineers, chemists, scientists, and other professional personnel concerned with selection, design, or control of biological processes for wastewater and sludge treatment.

The course is intended to enable course participants to evaluate treatment feasibility, select and design a biological process, and control the biological treatment system for any waste, and to enhance process control for any biologically treatable wastewater.

The course emphasizes biological treatment of complex or unusual wastes. Many of the laboratory experiments are performed using actual or synthetic industrial wastes. Most of the concepts and principles discussed are equally valid and applicable for domestic waste treatment. Both aerobic and anaerobic processes are considered. Trainees attend lectures and demonstrations, solve problems, and perform laboratory experiments which emphasize process principles and economics. Problem solutions and interpretation of laboratory results are emphasized.

A major portion of the course is devoted to the use of batch-type and continuous laboratory treatment procedures to select an appropriate treatment process and derive related design information. Other topics include organic and hydraulic loading, respiration rates, biosorption, solids production, relationship between chemical structure and treatability, process selection (considering several of the common activated sludge, trickling filtration and sludge digestion processes), wastewater treatment microorganisms, and treatment plant operation.

PHYSICAL-CHEMICAL TREATMENT OF WASTEWATERS AND SLUDGES (172)

2 weeks

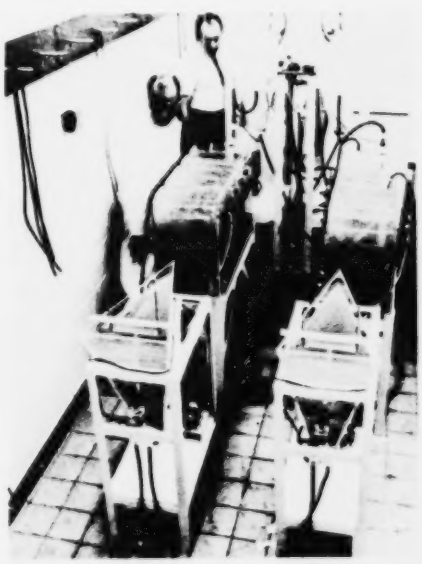
CINCINNATI, OHIO **December 9-20, 1968**

This course is offered for engineers, chemists, scientists and other professional personnel concerned with selection, design, and control of physical and or chemical methods of wastewater and sludge treatment. Biological treatment methods are covered in another course.

The course is designed to enable trainees to evaluate the feasibility of treating a waste by physical or chemical methods, select and design an appropriate process, and apply accepted control techniques to produce a suitable effluent or conditioned or concentrated sludge.

Trainees attend lectures and demonstrations and perform detailed laboratory experiments which illustrate treatment principles and economics. Laboratory experiments may be designed to evaluate two or more processes or to provide data for scale-up to pilot-scale or larger facilities. Since the course emphasizes treatment of unusual wastes, a semi-rational design approach is used. This approach combines the key elements of empirical (based on experience) and rational (having a theoretical basis) methods.

Major subject areas of the course include flocculation, mixing, sedimentation, flotation, incineration, vacuum filtration, solids concentration, sludge-drying, chemical oxidation, separation of emulsions, adsorption and absorption, cooling and psychrometric techniques, neutralization, ion exchange, and electrodialysis. A section of the course considers advanced waste treatment processes developed for removal of refractory materials which are resistant to or even totally unaffected by today's best conventional water and waste treatment processes.



BASIC PRINCIPLES OF WASTEWATER TREATMENT OPERATION (173)

1 week

CORVALLIS, OREGON **November 4-8, 1968**

This course is offered for treatment plant operating personnel seeking a general orientation in:

- Characteristic effects of wastewaters upon water quality
- Treatment operations used to remove objectionable pollutants
- Basic factors of operational control and maintenance
- Essentials of testing plant performance and reporting results
- The operator's function in water pollution control

This course is recommended also for those individuals in state and regional programs who are responsible for designing and conducting operator training courses.

Treatment facilities will be presented in terms of unit operations such as collection, pumping, clarification, mixing, flocculation, aeration, oxidation, and incineration. Engineering applications of these will be combined into processes in terms of the biological, chemical or physical behavior Typical plant schematic diagrams will be used to facilitate recognition of plant units, their function, and care. The same schematics will be used in presentation of basic tests, and calculations involving flow, concentration and loading as used for plant operational reports.

The teamwork approach will be stressed among the operator, his associates, his supervisors, his public, and local, state or regional agencies with respect to the services and information expected from him and the nature of assistance that he may obtain from others.

DESIGN AND MANAGEMENT OF SEWAGE TREATMENT FOR SMALL FEDERAL INSTALLATIONS (177)

1 week

CORVALLIS, OREGON **January 6-10, 1969**

This course is offered for supervisors, engineers, and other Federal personnel responsible for design, construction, or management of sewage disposal facilities at Federal installations. The course may also be of interest to engineers and supervisors in State and local agencies having responsibility for recreational areas and small institutions.

The course will cover waste treatment methods which are specially applicable to installations such as National Parks, Forest Service camps, small military installations, hospitals, schools and prisons.

On completion of this course, the trainee will have requisite technical information to assess a sewage treatment and disposal problem and how to select the most advantageous system for a given location.

In addition to the technical aspects of waste treatment and disposal, the legal responsibilities of public agencies, as they relate to adequate sewage treatment and disposal will be covered.

Course topics include:

- Federal policy and guidelines, Executive Order 11288
- States' criteria and requirements
- Non-water borne human waste disposal
- Septic tank and drainfield design
- Secondary sewage treatment methods
- Sewage lagoon applications
- Tertiary treatment methods
- Disinfection of effluents
- Surveillance and operational controls
- Preliminary engineering studies
- How to select best treatment method for a given application.

OPERATOR INSTRUCTOR TRAINING (180)

1 week

ATHENS, GEORGIA **January 13-17, 1969**

This course is designed for those persons having responsibility for designing, managing and teaching various types of "short courses" for wastewater treatment plant operators. Persons attending should have an interest in preparing and presenting training courses for operators. The course will review current teaching methods and the preparation and management of such short courses.

The objectives of the course are to have the trainee understand and write proper course objectives; be able to properly evaluate course content and course value; prepare and present a meaningful talk to an audience; and design a course for a specific training level. The trainee will have the opportunity to present prepared talks and have these critiqued. Considerable time will be devoted to discussion and practice of training methods and materials.

Topics to be covered include:

- Determination of training needs and objectives
- Course design
- Preparation and use of audio-visual materials
- Coaching practices and their use in on-the-job training
- Evaluation of training courses

Special attention will be given to the material that should be included and excluded from operator short courses and to levels of instruction. A portion of the course will be devoted to a review and discussion of existing manuals and audio-visual materials available for the training of wastewater plant operators.

Continuing construction and expansion of wastewater treatment facilities by all segments of society, coupled with an expanding technology, has increased the need for training and upgrading wastewater treatment plant operators. Many persons concerned with giving this training have had no formal instruction in teaching. This course will fill, in part, a special growing need in the water pollution control field.

This extremely important training will be made available at certain other FWPCA training facilities during the year. Dates and locations will be provided in special course announcements.

STATISTICAL METHOD EVALUATION AND QUALITY CONTROL FOR THE LABORATORY (751)

1 week

CINCINNATI, OHIO **August 26-30, 1968**
January 6-10, 1969
May 26-30, 1969

This course is designed for analysts having responsibility for evaluation of analytical methods and for supervisors desiring to maintain a quality control program on laboratory analyses. The objective of the course is to enable the trainees to understand and to apply principles of statistical method-evaluation and quality control. It will enable the trainee to evaluate analytical procedures regarding the precision and accuracy of the method, the identification, quantification, and control of errors, using both non-statistical and statistical techniques. Laboratory development of methods as to sensitivity, simplicity, specificity, etc. will not be discussed. These techniques will be applied to both intra-laboratory and inter-laboratory problems in the fields of air pollution, water pollution, milk and food, and radiological health.

Course topics include:

- Basic concepts of statistics
- Types of errors
- Methods for eliminating determinate errors
- Measuring uncontrollable errors
- Measures of precision and accuracy
- Principles of quality control
- Statistical quality control
- Control chart techniques
- Inter-laboratory quality control
- Statistical techniques used in method selection and evaluation.

GEOHYDROLOGIC RELATIONSHIPS IN WATER POLLUTION (168)

1 week

ADA, OKLAHOMA **February 24-28, 1969**

This course is intended for professional and technical personnel who are involved in operational programs of groundwater quality control.

The course is designed to provide information on the concepts of geology and hydrology in relation to groundwater. Knowledge of the influence or restraint of geologic formations and structures on the occurrence, movement and quality of groundwater is acquired through the use of illustrated lectures.

Field and laboratory methods and instrumentati n for acquiring necessary data on various physical and chemical parameters are investigated and studied. Social, economic and legal aspects of groundwater utilization are discussed.

WATER POLLUTION CONTROL IN FEDERAL INSTALLATIONS (176)

3 days

CINCINNATI, OHIO **November 12-14, 1968**

This course is offered to employees of any federal agency whose program activities may influence water quality. Such personnel may have either administrative or operational responsibilities and need not be experienced in water pollution control technology.

The major objective of this course is to familiarize trainees with the role of federal agencies in conducting the nation's water pollution abatement program. Secondarily, limited orientation in water pollution control technology is accomplished. Considerable time is devoted to explanation of the requirements of Executive Order 11288, Bureau of the Budget Circulars A-81 and A-85, and any other Government regulations pertaining to control of environmental pollution by government installations. Procedures for satisfying these requirements and also procuring technical services of the Federal Water Pollution Control Administration are explained using actual examples and case histories.

Training is accomplished through lecture presentations and panel and classroom discussions. Trainees are encouraged to present for discussion their own agency's pollution-related problems of administrative or technical nature.

GEOHYDROLOGIC RELATIONSHIPS IN WATER POLLUTION (168)

1 week

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Training is accomplished through lecture presentations and panel and classroom discussions. Trainees are encouraged to present for discussion their own agency's pollution-related problems of administrative or technical nature.

DATA EVALUATION AND ANALYSIS (171)

1 week

ADA, OKLAHOMA **December 9-13, 1968**

This course is intended for personnel responsible for administration, planning and/or supervision of projects involving accumulations and interpretation of numerical information pertaining to water quality. Professional specialists in the field of mathematical statistics who have developed highly sophisticated methodology and manipulative techniques which provide, for the other professions, the tools needed to accomplish the necessary evaluation and interpretation of accumulated data.

Utilization of these complex tools requires:

- Comprehensive understanding of statistical terminology and mathematical formulations
- Knowledge of procedural and operational constraints essential in accumulation of the numerical information (data)
- Understanding of the basic concepts of variation in mathematical functions in relation to variations in physical, ecological and environmental parameters
- Understanding of the potentials for and limitations of data analysis and evaluation

Problem assignments assure understanding of principles and methods presented in lectures. Application to particular problem situations of the course participant are discussed as appropriate.

STORET* SYSTEM (167)

1 week

CINCINNATI, OHIO **April 21-25,1969**

This course is intended for persons directly involved in processing water quality and water resources data. Such activities may include compiling, storing, retrieving, summarizing, collating, and analyzing water quality data.

The course is designed to develop skills necessary for rapid and efficient utilization of the STORET automatic data processing system for storing, retrieving, and analyzing water quality data and other related information.

Instruction will be provided in the basic principles and capabilities of the system and in the specific techniques of stream and lake coding, data storage, data retrieval, and data analysis using the STORET System. Course problems are based on actual practice and will provide trainees with experience in station location coding, data storage and modification, and retrieval and analysis.

The role of remote terminals in the STORET System will be explained.

Persons attending should have a technical background and experience in water quality and water resources work but need not have experience in computer programming. Persons with computer programming experience will find areas for further utilization of STORET principles relating to specialized problems.

*STORET - A coined word combining STOrage and RETrieval.

TABLE 2

RETRIEVAL DATE:

380003
LOCATION NAME
STATE NAME
MAJOR BASIN NAME
MINOR BASIN NAME

DATE FROM TO	TIME OF DAY	00007 SAMPLES IN COMPOSIT	00001 HSAMPLOC FT FROM RT BANK	00003 VSAMPLOC DEPTH FEET	00010 WATER TEMP CENT	00610 AMMONIA NH3-N MG/L	00620 NITRATE NO3-N MG/L	00615 NITRITE NO2-N MG/L	00660 ORTHOPO4 PO4 MG/L	31503 COLIFORM DLY ENDO MF/100ML	(PAR. NO.) ( ) (PAR ABBR) ( )
11 05 62	11 45		30	5	10.0	0.146	1.62	0.016	0.19	10K	DATA
11 05 62	11 47		30	10	9.9	0.172	1.85	0.019	0.22	500	FIELD:
11 05 62	11 55		60	5	10.1	0.188	2.06	0.021	0.26	880	
11 05 62	11 57		60	10	10.0	0.175	2.03	0.018	0.22	1120	8 digits
11 05 62	12 00		90	5	10.5	0.216	3.42	0.036	0.31	3000L	including
11 05 62	12 02		90	10	10.3	0.209	3.09	0.027	0.28	3000L	decimal
11 12 62		6				0.180	1.98	0.020	0.17		point
11 12 62	C										
11 19 62		6				0.174	1.81	0.016	0.15		
11 19 62	C										
11 26 62		6				0.182	2.06	0.024	0.19		
11 26 62	C										REMARKS
12 03 62		12				0.176	1.85	0.022	0.18		FIELD:
12 10 62	C										
12 17 62			60	5	7.2	0.166	1.72	0.019	0.16	1320	1 digit

Ada, Oklahoma
Athens, Georgia
Cincinnati, Ohio
College, Alaska
Corvallis, Oregon
Edison, New Jersey

FEDERAL WATER POLLUTION CONTROL ADMINISTRATION FACILITIES

offering

Water Pollution Control Technical Training

THE ROBERT S. KERR WATER RESEARCH CENTER

P. O. Box 1198

Ada, Oklahoma 74820

Commercial telephone number: Area Code 405 332–8800

COURSES TO BE OFFERED AT

THE ROBERT S. KERR WATER RESEARCH CENTER

Ada, Oklahoma

Water Quality Surveys - Field and Laboratory Procedures (261) . . . . . October 7-11, 1968

Water Quality Surveys - Planning and Implementation (262) . . . . . October 14-18, 1968

Data Evaluation and Analysis (171) . . . . . December 9-13, 1968

Geohydrologic Relationships in Water Pollution (168) . . . . . February 24-28, 1969

Basic Freshwater Biology (140) . . . . . April 7-11, 1969

Freshwater Pollution Ecology (143) . . . . . April 14-18, 1969

Water Quality Surveys - Field and Laboratory Procedures (261) . . . . . May 12-16, 1969

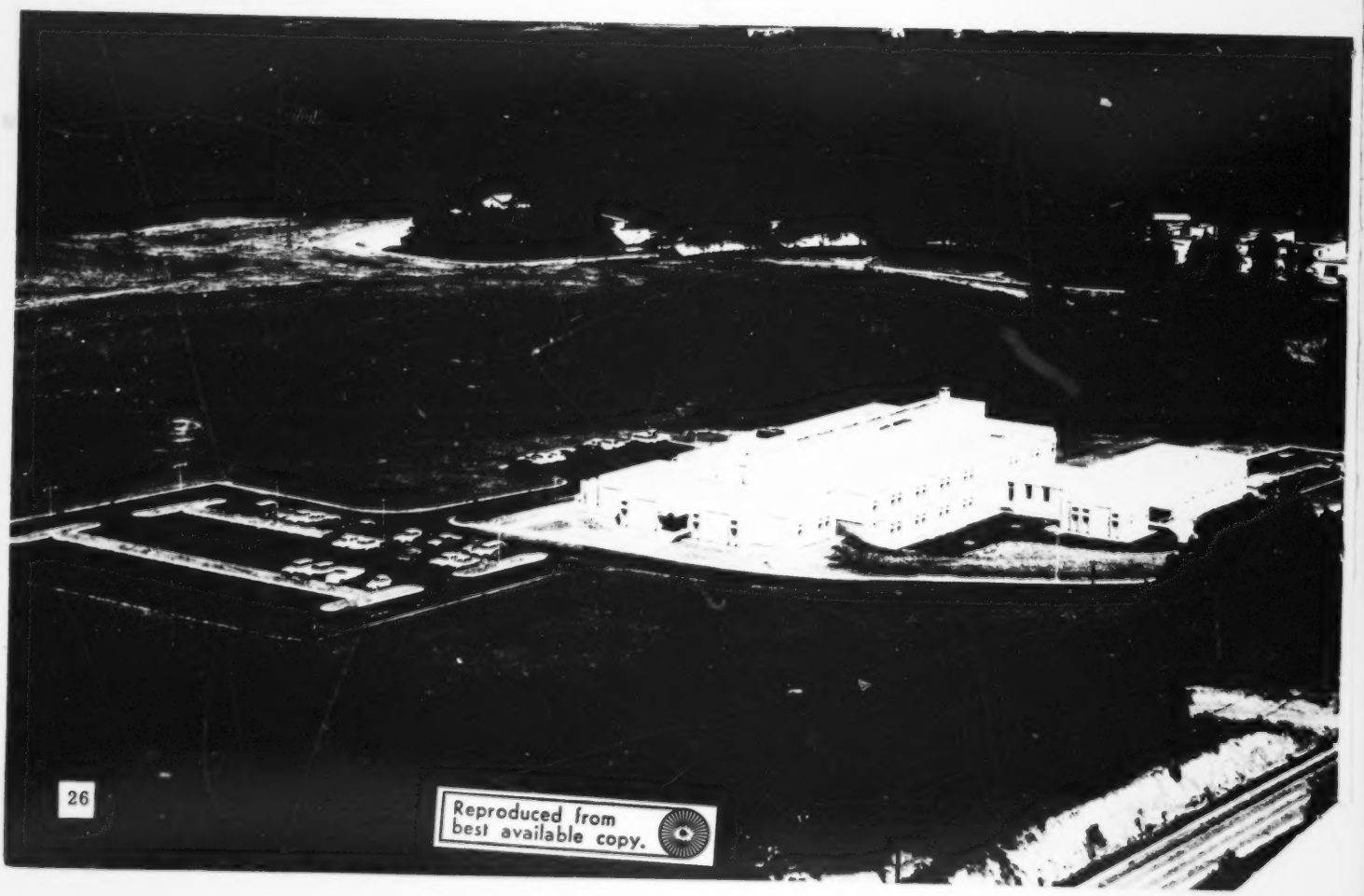
Water Quality Surveys - Planning and Administrative Concepts (262) . . . . . May 19-23, 1969

SOUTHEAST WATER LABORATORY

College Station Road

Athens, Georgia 30601

Commercial telephone number: Area Code 404 548—5641, Ext. 7261



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COURSES TO BE OFFERED AT

THE SOUTHEAST WATER LABORATORY

Athens, Georgia

Characterization and Treatment of Organic Industrial Wastes (101) . . . . . September 16-27, 1968

Laboratory Analyses in Treatment Plant Operations (105). . . . . November 18-22, 1968

Operator Instructor Training (180) . . . . . January 13-17, 1969

Analysis of Pesticides in the Aquatic Environment (103) . . . . . March 3-14, 1969

Membrane Filter Methods in Treatment Plant Operations (121) . . . . . April 21-25, 1969

Basic Freshwater Biology (140) . . . . . June 16-20, 1969

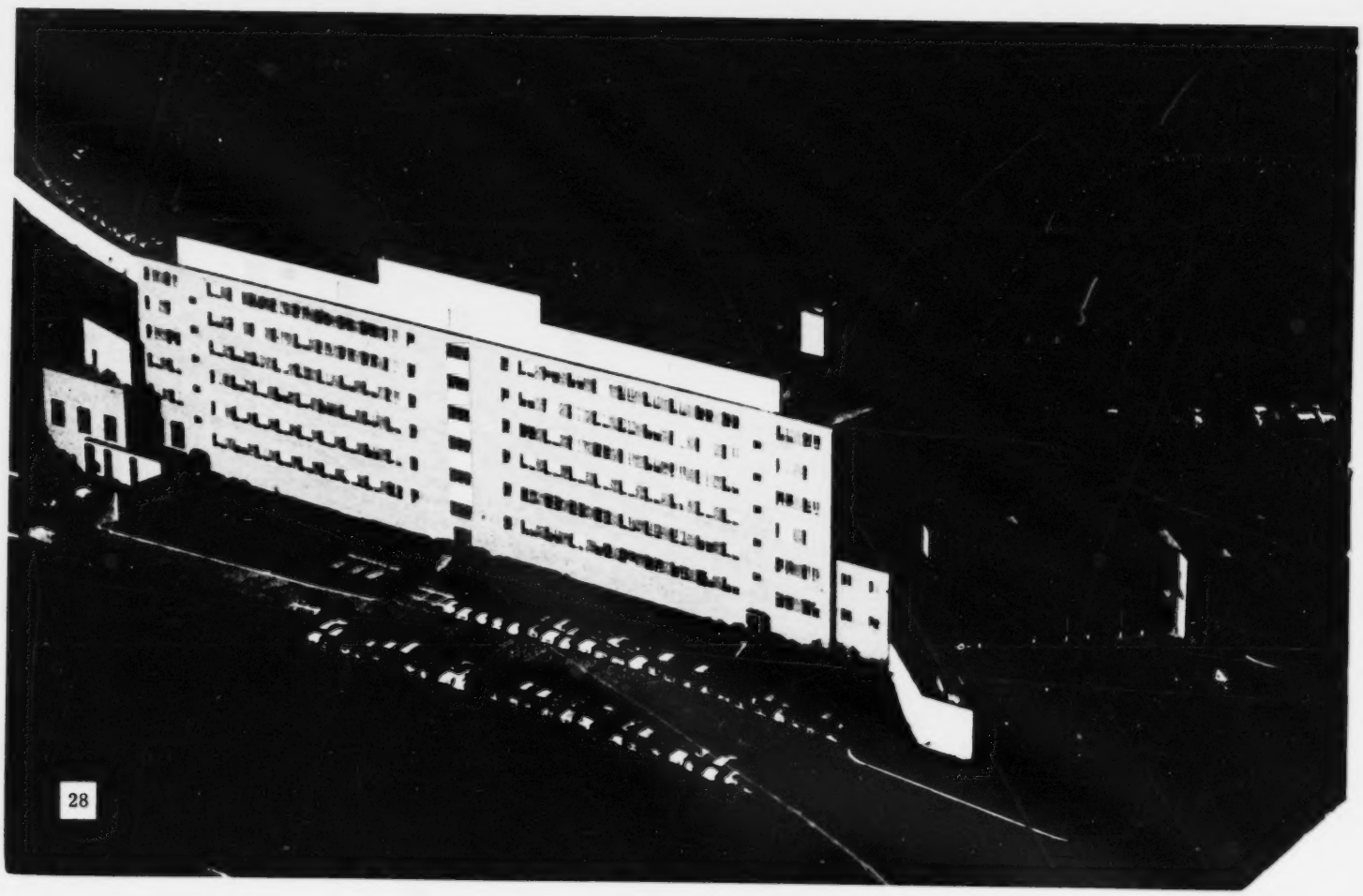
Freshwater Pollution Ecology (143). . . . . June 23-27, 1969

THE ROBERT A. TAFT SANITARY ENGINEERING CENTER

4676 Columbia Parkway

Cincinnati, Ohio 45226

Commercial telephone number: Area Code 513 871–1820 Ext. 248



COURSES TO BE OFFERED AT

THE ROBERT A. TAFT SANITARY ENGINEERING CENTER

Cincinnati, Ohio

Chemical Analyses for Water Quality (100) . . . . . July 15-26, 1968

Water Quality Studies (161)* . . . . . August 12-23, 1968

Membrane Filter Methods in Treatment Plant Operations (121) . . . . . September 9-13, 1968

Plankton Analysis (141) . . . . . October 7-18, 1968

Laboratory Analyses in Treatment Plant Operations (105) . . . . . October 28-November 8, 1968

Water Pollution Control for Federal Installations (176) . . . . . November 12-14, 1968

Physical-Chemical Treatment of Wastewaters and Sludges (172) . . . . . December 9-20, 1968

Current Practices in Water Microbiology (120) . . . . . January 6-17, 1969

Applied Biology Seminar (146) . . . . . January 22-24, 1969

Orientation to Automated Instrumentation in Surveillance (106) . . . . . January 27-31, 1969

Biological Treatment of Wastewaters and Sludges (162) . . . . . February 10-21, 1969

Introductory Microscopic Analysis (142) . . . . . February 24-28, 1969

STORET System (167) . . . . . April 21-25, 1969

Analysis of Pesticides in the Aquatic Environment (103) . . . . . April 28-May 9, 1969

Basic Freshwater Biology (140) . . . . . May 19-23, 1969

Freshwater Pollution Ecology (143) . . . . . May 26-30, 1969

*To be presented in Harrisburg, Pennsylvania in cooperation with the Pennsylvania State Department of Health.

ALASKA WATER LABORATORY

P O. Box 617

College, Alaska 99735

Commercial telephone number: Area Code 907 479—2251

COURSE TO BE OFFERED AT

ALASKA WATER LABORATORY

College, Alaska

Marine Pollution Ecology Seminar (147) . . . . . June 24-27, 1969

PACIFIC NORTHWEST WATER LABORATORY

200 S. 35th Street

Corvallis, Oregon 97330

Commercial telephone number: Area Code 503 752—4281, Ext.318

COURSES TO BE OFFERED AT
THE PACIFIC NORTHWEST WATER LABORATORY

Corvallis, Oregon

Water Quality Studies (161)	July 15-26, 1968
Basic Freshwater Biology (140)	September 9-13, 1968
Freshwater Pollution Ecology (143)	September 16-20, 1968
Basic Principles of Wastewater Treatment (173)	November 4-8, 1968
Current Practices in Water Microbiology (120)	December 2-13, 1968
Design and Management of Sewage Treatment and Disposal for Federal Installations (177)	January 6-10, 1969
Chemical Analyses for Water Quality (100)	March 10-21, 1969
Laboratory Analyses in Treatment Plant Operations (105)	May 5-16, 1969

NORTH ATLANTIC WATER QUALITY MANAGEMENT CENTER

Federal Water Pollution Control Administration

Edison, New Jersey 08817

Commercial telephone number: Area Code 201 548–3347, Ext. 4615

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COURSES TO BE OFFERED AT

NORTH ATLANTIC WATER QUALITY MANAGEMENT CENTER

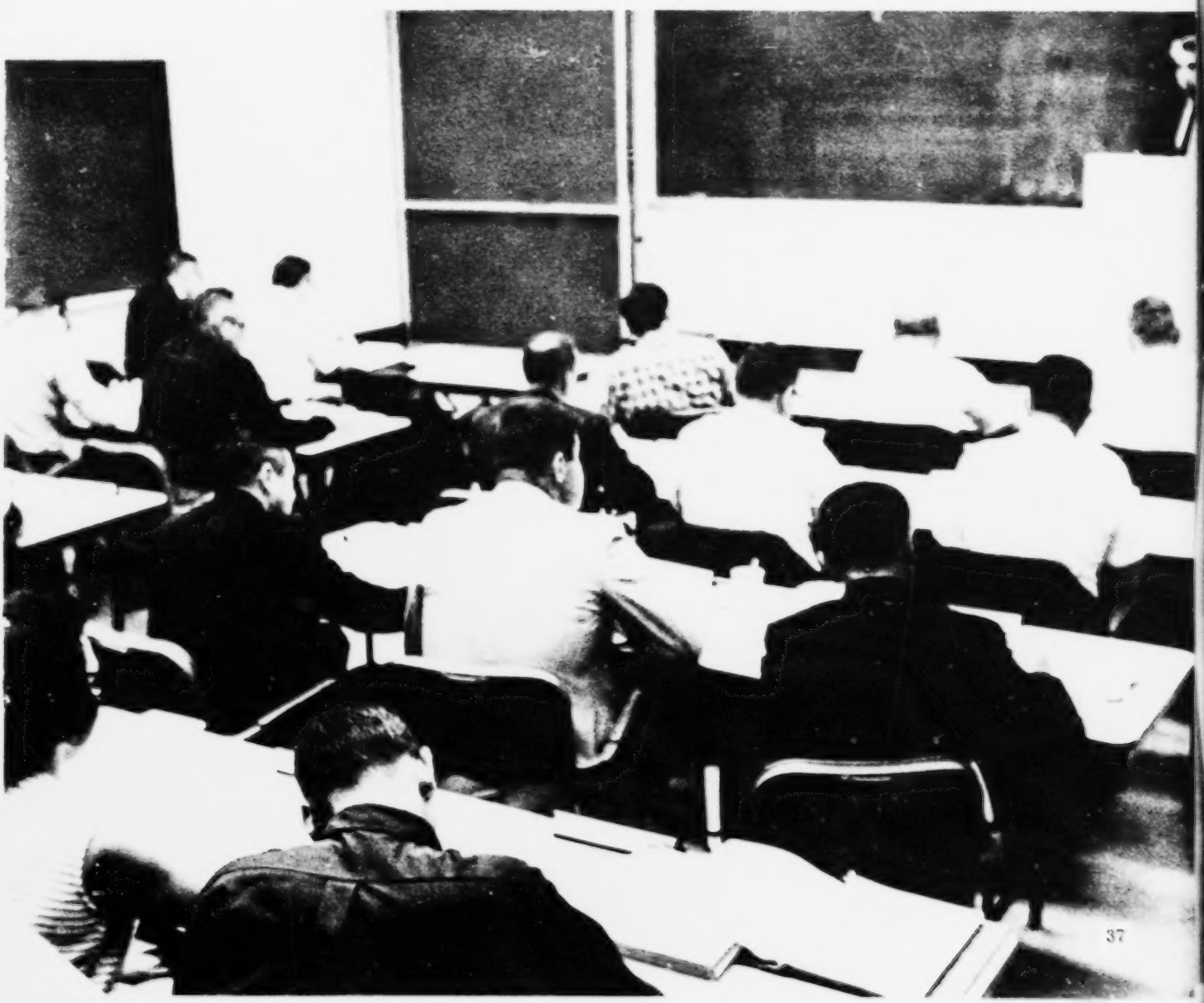
Edison, New Jersey

Basic Marine Biology (144) . . . . . October 21-25, 1968

Laboratory Analyses in Treatment Plant Operations (105) . . . . . January 27- February 7, 1969

Water Quality Studies (161) . . . . . February 10-21, 1969

Applications



U.S. DEPARTMENT OF THE INTERIOR

FORM APPROVED
BUDGET BUREAU
NO. 42-R1506

Federal Water Pollution Control Administration
Technical Training Program

APPLICATION FOR TRAINING

I. NAME OF APPLICANT:

Mr.
Mrs.
Miss _____

(first) (middle initial) (last)

II. COURSE DESIRED:

Title _____ Course No. _____

Place where given _____ Dates _____

FWPCA Training Office conducting course _____

III. SPONSOR OR EMPLOYER:

Name of Organization or Firm _____

Address _____

_____ Phone _____

IV. MAILING ADDRESS OF APPLICANT (If different from above):

_____

_____ Phone _____

V. PROFESSIONAL STATUS:

Profession or Occupation _____

Position Title _____

Brief description of your present position _____

_____

_____

_____

Total years experience in profession _____

VI. PREVIOUS WATER POLLUTION CONTROL TRAINING COURSES ATTENDED:

Titles	Dates	Location

VII. EDUCATION:

High School Graduate: Yes ____ No ____

Number of years education completed beyond high school _____

College or University	Date attended	Major	Degree

VIII. SIGNATURES:

_____ _____

Signature of Applicant Date

MAIL TO THE FWPCA OFFICE CONDUCTING THE TRAINING COURSE

Training Activities, FWPCA
Robert S. Kerr Water Research Center
P.O. Box 1198
Ada, Oklahoma 74820

Training Activities, FWPCA
Robert A. Taft Sanitary Engineering Center
4676 Columbia Parkway
Cincinnati, Ohio 45226

Training Activities, FWPCA
North Atlantic Water Quality Management Center
Metuchen, New Jersey 08840

Training Activities, FWPCA
Pacific Northwest Water Laboratory
200 S. 35th Street
Corvallis, Oregon 97330

Training Activities, FWPCA
Southeast Water Laboratory
College Station Road
Athens, Georgia 30601

FORM APPROVED
BUDGET BUREAU
NO. 42-R1506

U.S. DEPARTMENT OF THE INTERIOR

Federal Water Pollution Control Administration
Technical Training Program

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I. NAME OF APPLICANT:

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Miss _____
(first) (middle initial) (last)

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Title _____ Course No. _____

Place where given _____ Dates _____

FWPCA Training Office conducting course _____ _____

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Name of Organization or Firm _____

Address _____

_____ Phone _____

IV. MAILING ADDRESS OF APPLICANT (If different from above):

_____

_____ Phone _____

V. PROFESSIONAL STATUS:

Profession or Occupation _____

Position Title _____

Brief description of your present position _____

_____

_____

_____

Total years experience in profession _____ _____

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Titles	Dates	Location

VII. EDUCATION:

High School Graduate: Yes ____ No ____

Number of years education completed beyond high school _____

College or University	Date attended	Major	Degree

VIII. SIGNATURES:

_____ _____

Signature of Applicant *Date*

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Training Activities, FWPCA
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P.O. Box 1198
Ada, Oklahoma 74820

Training Activities, FWPCA
Robert A. Taft Sanitary Engineering Center
4676 Columbia Parkway
Cincinnati , Ohio 45226

Training Activities, FWPCA
North Atlantic Water Quality Management Center
Metuchen, New Jersey 08840

Training Activities, FWPCA
Pacific Northwest Water Laboratory
200 S. 35th Street
Corvallis, Oregon 97330

Training Activities, FWPCA
Southeast Water Laboratory
College Station Road
Athens, Georgia 30601

FWPCA-97 (2-67) (Reverse)

FORM APPROVED
BUDGET BUREAU
NO. 42-R1506

U.S. DEPARTMENT OF THE INTERIOR

Federal Water Pollution Control Administration
Technical Training Program

APPLICATION FOR TRAINING

I. NAME OF APPLICANT:

Mr.
Mrs.
Miss _____
(first) (middle initial) (last)

II. COURSE DESIRED:

Title _____ Course No. _____

Place where given _____ Dates _____

FWPCA Training Office conducting course _____

III. SPONSOR OR EMPLOYER:

Name of Organization or Firm _____

Address _____

_____ Phone _____

IV. MAILING ADDRESS OF APPLICANT (If different from above):

_____

_____ Phone _____

V. PROFESSIONAL STATUS:

Profession or Occupation _____

Position Title _____

Brief description of your present position _____

_____

_____

_____

Total years experience in profession _____

VI. PREVIOUS WATER POLLUTION CONTROL TRAINING COURSES ATTENDED:

Titles	Dates	Location

VII. EDUCATION:

High School Graduate: Yes ____ No ____

Number of years education completed beyond high school _____

College or University	Date attended	Major	Degree

VIII. SIGNATURES:

_____ _____

Signature of Applicant *Date*

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P.O. Box 1198
Ada, Oklahoma 74820

Training Activities, FWPCA
Robert A. Taft Sanitary Engineering Center
4676 Columbia Parkway
Cincinnati , Ohio 45226

Training Activities, FWPCA
North Atlantic Water Quality Management Center
Metuchen, New Jersey 08840

Training Activities, FWPCA
Pacific Northwest Water Laboratory
200 S. 35th Street
Corvallis, Oregon 97330

Training Activities, FWPCA
Southeast Water Laboratory
College Station Road
Athens, Georgia 30601

FORM APPROVED
BUDGET BUREAU
NO. 42-R1506

U.S. DEPARTMENT OF THE INTERIOR

Federal Water Pollution Control Administration
Technical Training Program

APPLICATION FOR TRAINING

I. NAME OF APPLICANT:

Mr.
Mrs.
Miss _____
(first) (middle initial) (last)

II. COURSE DESIRED:

Title _____ Course No. _____

Place where given _____ Dates _____

FWPCA Training Office conducting course _____

III. SPONSOR OR EMPLOYER:

Name of Organization or Firm _____

Address _____

_____ Phone _____

IV. MAILING ADDRESS OF APPLICANT (If different from above):

_____

_____ Phone _____

V. PROFESSIONAL STATUS:

Profession or Occupation _____

Position Title _____

Brief description of your present position _____

_____

_____

_____

Total years experience in profession _____

VI. PREVIOUS WATER POLLUTION CONTROL TRAINING COURSES ATTENDED:

Titles	Dates	Location

VII. EDUCATION:

High School Graduate: Yes ____ No ____

Number of years education completed beyond high school _____

College or University	Date attended	Major	Degree

VIII. SIGNATURES:

_____ _____

Signature of Applicant Date

MAIL TO THE FWPCA OFFICE CONDUCTING THE TRAINING COURSE

Training Activities, FWPCA
Robert S. Kerr Water Research Center
P.O. Box 1198
Ada, Oklahoma 74820

Training Activities, FWPCA
Robert A. Taft Sanitary Engineering Center
4676 Columbia Parkway
Cincinnati, Ohio 45226

Training Activities, FWPCA
North Atlantic Water Quality Management Center
Metuchen, New Jersey 08840

Training Activities, FWPCA
Pacific Northwest Water Laboratory
200 S. 35th Street
Corvallis, Oregon 97330

Training Activities, FWPCA
Southeast Water Laboratory
College Station Road
Athens, Georgia 30601

FWPCA-97 (2-67) (Reverse)

FORM APPROVED
BUDGET BUREAU
NO. 42-R1506

U.S. DEPARTMENT OF THE INTERIOR

Federal Water Pollution Control Administration
Technical Training Program

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Mr.
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(first) (middle initial) (last)

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Place where given _____ Dates _____

FWPCA Training Office conducting course _____

III. SPONSOR OR EMPLOYER:

Name of Organization or Firm _____

Address _____

_____ Phone _____

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_____

_____ Phone _____

V. PROFESSIONAL STATUS:

Profession or Occupation _____

Position Title _____

Brief description of your present position _____

_____

_____

_____

Total years experience in profession _____

VI. PREVIOUS WATER POLLUTION CONTROL TRAINING COURSES ATTENDED:

Titles	Dates	Location

VII. EDUCATION:

High School Graduate: Yes ____ No ____

Number of years education completed beyond high school _____

College or University	Date attended	Major	Degree

VIII. SIGNATURES:

_____ _____

Signature of Applicant *Date*

MAIL TO THE FWPCA OFFICE CONDUCTING THE TRAINING COURSE

Training Activities, FWPCA
Robert S. Kerr Water Research Center
P.O. Box 1198
Ada, Oklahoma 74820

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Southeast Water Laboratory
College Station Road
Athens, Georgia 30601

FWPCA-97 (2-67) (Reverse)

Chronological Schedule of Courses

Chemical Analyses for Water Quality (100), Cincinnati, Ohio. . . . . July 15-26, 1968
Water Quality Studies (161), Corvallis, Oregon . . . . . July 15-26, 1968
Water Quality Studies (161), Harrisburg, Pennsylvania . . . . . August 12-23, 1968
Membrane Filter Methods in Treatment Plant Operations (121)
Cincinnati, Ohio . . . . . September 9-13, 1968
Basic Freshwater Biology (140), Corvallis, Oregon . . . . . September 9-13, 1968
Freshwater Pollution Ecology (143), Corvallis, Oregon . . . . . September 16-20, 1968
Characterization and Treatment of Organic Industrial Wastes (101)
Athens, Georgia . . . . . September 16-27, 1968
Basic Principles of Wastewater Treatment (173),
Corvallis, Oregon . . . . . November 4-8, 1968
Plankton Analysis (141), Cincinnati, Ohio . . . . . October 7-18, 1968
Water Quality Surveys-Field and Laboratory Procedures (261)
Ada, Oklahoma . . . . . October 7-11, 1968
Water Quality Surveys-Planning and Administrative Concepts (262)
Ada, Oklahoma . . . . . October 14-18, 1968
Basic Marine Biology (144), Edison, New Jersey . . . . . October 21-25, 1968
Laboratory Analyses in Treatment Plant Operations (105),
Cincinnati, Ohio . . . . . October 28-Nov. 8, 1968
Water Pollution Control for Federal Installations (176),
Cincinnati, Ohio . . . . . November 12-14, 1968
Laboratory Analyses in Treatment Plant Operations (105),
Athens, Georgia. . . . . November 18-22, 1968
Current Practices in Water Microbiology (120), Corvallis, Oregon . . . . . December 2-13, 1968
Data Evaluation and Analysis (171), Ada, Oklahoma. . . . . December 9-13, 1968
Physical-Chemical Treatment of Wastewaters and Sludges (172),
Cincinnati, Ohio . . . . . December 9-20, 1968
Laboratory Analyses in Treatment Plant Operations (105),
Edison, New Jersey . . . . . January 27-February 7, 1969
Design and Management of Sewage Treatment and Disposal for
Federal Installations (177), Corvallis, Oregon . . . . . January 6-10, 1969
Current Practices in Water Microbiology (120), Cincinnati, Ohio. . . . . January 6-17, 1969
Operator Instructor Training (180), Athens, Georgia . . . . . January 13-17, 1969
Applied Biology Seminar (146), Cincinnati, Ohio . . . . . January 22-24, 1969
Orientation to Automated Instrumentation in Surveillance (106),
Cincinnati, Ohio . . . . . January 27-31, 1969
Biological Treatment of Wastewaters and Sludges (162),
Cincinnati, Ohio . . . . . February 10-21, 1969
Water Quality Studies (161), Edison, New Jersey. . . . . February 10-21, 1969
Introductory Microscopic Analysis of Water (142), Cincinnati, Ohio . . . . . February 24-28, 1969
Geohydrologic Relationships in Water Pollution (168),
Ada, Oklahoma . . . . . February 24-28, 1969
Analysis of Pesticides in the Aquatic Environment (103),
Athens, Georgia . . . . . March 3-14, 1969
Chemical Analyses for Water Quality (100), Corvallis, Oregon . . . . . March 10-21, 1969
Basic Freshwater Biology (140), Ada, Oklahoma. . . . . April 7-11, 1969
Freshwater Pollution Ecology (143), Ada, Oklahoma . . . . . April 14-18, 1969
Membrane Filter Methods in Treatment Plant Operations (121),
Athens, Georgia . . . . . April 21-25, 1969
STORET System (167), Cincinnati, Ohio . . . . . April 21-25, 1969
Analysis of Pesticides in the Aquatic Environment (103),
Cincinnati, Ohio . . . . . April 28-May 9, 1969
Laboratory Analyses in Treatment Plant Operations (105),
Corvallis, Oregon . . . . . May 5-16, 1969
Water Quality Surveys-Field and Laboratory Procedures (261),
Ada, Oklahoma . . . . . May 12-16, 1969
Water Quality Surveys-Planning and Administrative Concepts (262)
Ada, Oklahoma . . . . . May 19-23, 1969
Basic Freshwater Biology (140), Cincinnati, Ohio . . . . . May 19-23, 1969
Freshwater Pollution Ecology (143), Cincinnati, Ohio . . . . . May 26-30, 1969
Basic Freshwater Biology (140), Athens, Georgia . . . . . June 16-20, 1969
Freshwater Pollution Ecology (143), Athens, Georgia. . . . . June 23-27, 1969
Marine Pollution Ecology Seminar (147), Anchorage, Alaska. . . . . June 24-27, 1969